5. Sketch general outline, rays (steamers), and rifts.

Near end of totality.

6. Sketch general outline and any rays of streamers or rifts.

7. Note if there be a blaze of light or glare where the sun is about to reappear.

After totality.

8. Sketch any rays that may be visible; give length, colour, and structure, as well as position.

Questions to be answered in writing immediately totality is over.

a. Has there been any change? if so, specify what change.

b. Have especially the *dark rays* or rifts changed?

c. Describe what has been constant throughout, and define its structure.

d. State the colours you observed outside the red prominences.

e. Were the colours anywhere arranged *in layers* round the sun?

f. Were the colours anywhere arranged *radially?*

g. As the moon passed over the sun were the colours similar to those successively thrown over any one portion of the landscape?

h. State colours of rays and of spaces between them.

i. Did the dark rifts extend down to the moon, or did they stop short above the denser layers of the chromosphere?

k. Were the rays brightest near or far away from the moon?

l. What was the comparative brightness of the rays, chromosphere, and outer corona?

N.B.—Cards should be prepared, 8 inches square, with a circle 2 inches in diameter, filled in with some dark colour, in the centre. Round this circle the sketches should be made, the north point (or the vertex, as the case may be) being shown, and whether the sketches were made by means of an inverting telescope or with the naked eye.

SUGGESTIONS FOR TIMING THE PROGRESS OF THE ECLIPSE.—In Sicily, last year, the following method of recording the lapse of time during totality was found to prevent all excitement, and made the 80 seconds seem a very long time.

Determine the number of seconds of totality at the station—say 120.

Then, at the moment of totality, let one person attached to each party of observers, carefully observing the face of a chronometer or watch, say—

"You have now 120 seconds."

After 5 seconds,

"You have still 115 seconds."

After another 5 seconds,

"There are still 110 seconds remaining;"

and so on.

This may be done in a very steadying manner.

The times at which any of the phenomena occur must be noted by another observer. J. N. L.

HISTOLOGY

The Auditory Organ of Gasteropoda

DR. F. LEYDIG, of Tübingen, gives an interesting account of the Auditory Organ of Gasteropoda in the last part of Max Schultze's *Archiv für Mikroskopische Anatomie.* After a short historical introduction, in which the labours of previous observers are referred to, Prof. Leydig describes the form and divisions of the brain or cerebral ganglia in this class, and shows that these are fundamentally the same in *Limax, Arion, Vitrina, Helix, Clausilia, Carychium, Succinea, Physa, Planorbis, Ancylus.* This supra-œsophageal or cerebral ganglion in these animals consists of two superior ganglionic lateral masses united by a commissure. The subœsophageal ganglion consists of an anterior portion, the ganglion pedale, and a posterior, the ganglion viscerale, which again are connected with the supraœsophageal ganglion by commissural bands. The ring thus formed is traversed by the œsophagus, the excretory ducts of the salivary glands, and the aorta. The anterior lobes of the cerebral ganglion give off the nerves of the tentacles and the optic nerves, and four other pairs. The auditory organ is *apparently* connected with the anterior division of the subœsophageal ganglion. It varies but little in size in different species, whatever may be their difference in magnitude. The organ is of spherical form, as seen from above, but flattened when seen in profile, where it is in contact with the ganglion. It is composed of a connective tissue capsule, made up of two layers—an outer looser investment, and an inner firmer tissue; between the two is a plexiform arrangement of muscular fibres and fasciculi. The inner capsule is lined by a layer of epithelium, which is thicker opposite the point of attachment of the nerve than elsewhere, and when perfectly fresh presents a very indistinct division into cells; of these there appear to be two varieties characterised by their nuclei; one form of nucleus being small, and lying near the attached surface of the cells, that is to say, externally; the other large and round, with a fusiform nucleus. Cilia appear to be always present, but are so extremely fine as to be occasionally scarcely visible. It is most distinct in *Ancylus fluviatilis,* and in this animal the trembling movement of the otoliths is most perceptible. He has seen appearances in *Helix hortensis* and *Clausilia similis,* which lead him to think that the large nucleated cells have bristles attached to them, instead of cilia like the smaller cells. The otoliths exhibit some, though insignificant, variations in size, form, and number. The majority approximate to an oval form, as in the *Helicinidæ;* they are more pointed in *Ancylus* and *Planorbis.* Smaller animals, as *Carychium minimum,* have very small otoliths. They are rounder in young than in older specimens of *Helix,* and at a later period they assume a cell-like appearance, the central part being clearer than the periphery, or a space forming in it which resembles a nucleolus; but he has no doubt, from his previous observations on the embryos of *Paludina vivipara,* that they crystallise out from the fluid of the auditory vesicle; being at first punctiform bodies, then become pointed at their extremities, and increasing by the deposition of successive laminæ on their surface. The idea suggested that they gain entrance from without is quite erroneous. His examinations of the real connections of the auditory nerve succeeded best in *Vitrina diaphana,* and these showed that the lateral commissures of the brain connecting the supra- and infra-œsophageal masses consist of the two commissures themselves, of a sympathetic nerve, of the auditory nerve or canal, and a blood vessel, all connected together by loose connective tissue. The auditory nerve, after leaving the capsule, first runs obliquely outwards to follow the curvature of the anterior division of the infra-œsophageal ganglion, then suddenly bends upwards, and thus ultimately reaches, not the infra-, but the supra-œsophageal ganglion with which it is really in connection. Though holding the same relation to the ear that the optic nerve does to the eye, it differs from ordinary nerves in being hollow; hence its name of ear canal. The wall consists, like that of a nerve, of a homogeneous membrane, surrounded by looser connective tissue, and lined by epithelium. The interior is not filled with nerve fibrillæ. Prof. Leydig then notices the relations of this nerve to the passage leading from the ear towards the skin in *Cephalopoda,* in connection with which, however, no external opening has been found, though searched for, by Owsjannikow, Kowalewsky, and Boll.

SCIENTIFIC SERIALS

IN the *Quarterly Journal of Science* for October, three of the articles are continuations of papers which have appeared in previous numbers of the Journal. Mr Mungo Ponton concludes his discussion of "Molecules, Ultimates, Atoms, and Waves." Lieut. S. P. Oliver gives another paper "On Modern British Ordnance and Ammunition," detailing the structure of some recently manufactured ordnance; and from the editor we have "Some further Experiments of Psychic Force." After replying to adverse criticisms on his previous paper, Mr. Crookes details some fresh experiments which he considers to "confirm beyond doubt the conclusions at which he arrived in his former paper, namely the existence of a force associated in some measure not yet explained, with the human organisation, by which force increased weight is capable of being imparted to solid bodies without physical contact." The experiments detailed were all performed in the presence of Mr. D. D. Home, or of a lady in whom this force is stated to be remarkably developed; the accordion is no longer employed, while in the balance experiments the operator's hands, instead of lying on the board attached to the balance, are placed in a vessel of water laid on the board. Mr. W. Mattieu Williams gives a useful abstract of the views advanced in his "Fuel of the Sun," for the benefit of those who have not time to read the larger work. The author of an anonymous paper "On the recent Gun-cotton Explosion" condemns the reaction against the use of gun-cotton, which has set in since the Stowmarket catastrophe, and attributes the explosion to culpable carelessness in the process of washing the free acid out

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of the cotton, and the extent of the disaster to the fact of the utterly needless stowage of large quantities of the manufactured article in the factory itself.

THE *Zeitschrift für Ethnologie* (1871, Heft iii.) begins with the second number of a series of papers by A. Ermann, entitled "Ethnographic Observations on the Coasts of Bering's Sea." The author passes in review the various articles of food and the vessels and methods employed for its preparation among the numerous tribes inhabiting the islands, coastlands, and interior of North-Western America; and he endeavours from his observations of this phase of domestic life to deduce conclusions in reference to the identity, or differences of origin, of these races. Herr Ermann draws attention to the fact that the Aleutians, like the people of Kamtschatka, subject some kind of fish to a process of fermentation before eating it, and that these, as well as all the neighbouring races, show a decided repugnance to the use of salted food, and ascribe to their abstinence from such a diet their superiority over the Russians both as regards length of vision and the continuance of unimpaired sight to old age. Heated stones thrown by means of wooden tongs into a wooden, or basket-work vessel, were everywhere found to be in frequent if not universal use as a substitute for our methods of boiling; and where vessels of a large size were required for preparing blubber, their wooden boats were used for the purpose, and the oil poured into bladders to be kept, not only to light their dwellings, but also to heat them by means of their bone lamps, known as *zirniki*. The Aleutians are the most advanced of all the tribes, and have amalgamated so thoroughly with the Russians, among whom they have lived, that it is difficult at first sight to detect their national characteristics from those which they have borrowed from their conquerors. In physiognomy they differ, however, very strikingly, and their dark, yellowish-brown skins and obliquely cut eyes remind one of the Mongolian type. The author treats of the sexual relations of the Aleutians, their early marriages, and the forms of polygamy and diandry practised among them; and describes their singular social houses, in which from 50 to 200 individuals live together in one house of considerable size (180 feet in length), sunk ten or fifteen feet below the surface of the ground. This paper, which is exhaustive as far as it goes, concludes with a notice of the boats, modes of navigation, and hunting. and of the weapons of these people, whose history has, in the present day, acquired special interest since the purchase of Russian America by the Americans. We have next a paper on the "Archæological Remains of Brandenburg," by the Prussian district judge, Ernst Friedel. It possesses scarcely more than a local interest, except in regard to the notice of the lost town in Blumenthal, the name and age of which are unknown, and whose history seems clouded in mystery. In 1689 the walls were still standing six feet above the ground, and the foundations of a church, of two large buildings conjectured to have been a castle, and of a townhall, could still be traced, with the well-defined positions of outer walls, gates, fosses, main and transverse streets, &c.; yet long before that time all knowledge of the place had been lost. When Prof. Beckman recorded its condition in 1751 (in his "History of the Margravate of Brandenburg"), a thick growth of trees had nearly obliterated the stone outlines of this lost town. Judge Friedel last visited the spot in 1870, at which time the walls had disappeared, but there remained traces of graves and of the foundations of Cyclopean walls, which, together with the presence of the so-called Semnonian stone, known in the district as the "Stone of the Marches," inclined him to the opinion that we have here the site of a prehistoric seat of worship, with its surrounding habitations. The stone, which lies at the foot of an oak, is about seven feet in length and six feet in width. The author is of opinion that the traditions and remains of the lost town of Blumenthal may refer to two widely separated periods; and that it may be a station of the ancient Semnones re-occupied in the 10th, 11th, and 12th centuries, or later; many German villages having become extinct in those troubled times, and even during the Hussite and other religious wars.

THE *K. Danske vid. Selsk Forh.* contains an interesting paper, incorporated in the *Z. f. Ethnologie*, by Prof. A. C. Oersted, on the *Silphium* of the ancients, which formed the staple commerce of the Roman colony of Cyrene, in North Africa, the present Barka. It was esteemed a great luxury by Greek and Roman epicures, who used its milky juice, mixed with meal, to give piquancy to their food, and employed it likewise medicinally. Under the rule of the Ptolemies the trade fell off, until at length, under the Emperor Nero, the consignment of one plant of the Silphium was deemed worthy of record. From a careful examination of the representations of this plant with its fruit on the coins of Cyrene, Prof. Oersted is led to infer that the much coveted Silphium was nearly allied to the *Narthex asafœtida*, found by Falconer in Northern Kaschmir, and since cultivated with success in the Botanical Gardens in Edinburgh, and he gives two plates in illustration of his opinion, one of which shows the Narthex reduced to the size of the plant delineated on the Cyrenian coin, the other being a *facsimile* of the coin itself. The resemblance between the two is most striking.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, October 16.—M. Chasles communicated some theorems concerning the determination of a series of groups of points on a geometrical curve.—M. P. A. Favre read a continuation of his thermic investigations upon voltaic energy, in which he described the results obtained under various conditions with batteries consisting of a plate of the alloy of palladium and hydrogen in dilute sulphuric acid and of a plate of platinum in solution of sulphate of copper. He tabulates his results, and also gives the results of experiments on the electrolysis of the acids employed.—M. Lecoq de Boisbaudran presented a memoir on some points of spectrum-analysis and on the constitution of induction-sparks.—M. F. M. Raoult presented a memoir giving the results of investigations of the calorific coefficients of the hydro-electric and thermo-electric currents, from which he concludes that the heat evolved by an electric current is independent of the nature of the battery employed, the calorific coefficient K*e* being the same for all sources of voltaic electricity.—M. Delaunay noticed the reappearance of Tuttle's comet, which was discovered at Marseilles by M. Borelly on the night of the 12th–13th October. The reappearance of this comet at the time calculated is important as confirming its supposed identity with the second comet of 1790.—M. Chasles replied to the remarks made by M. Bertrand at the last meeting on the subject of the Arabian astronomer, Aboul Wéfa.—M. Berthelot communicated a further note on his researches upon the ammoniacal salts of the weak acids, relating chiefly to certain thermic phenomena observed when a solution of carbonate of ammonia is mixed with solutions of other alkaline carbonates.—A note by MM. C. Friedel and R D. Silva on the action of chlorine upon various bodies of the series in C^3 and on the isomers of trichlorhydrine was read.—M. Marey communicated a note on the duration of the electric discharge in the torpedo, in continuation of a note presented by him to the last meeting.

PHILADELPHIA

Academy of Natural Sciences.—April 18.—Mr. Vaux, Vice-President, in the chair.—Prof. Leidy made the following remarks on some extinct turtles from Wyoming Territory. Several species of extinct turtles from the tertiary deposits of Wyoming differ from those previously described by me from the same formation. They are indicated by imperfect, though sufficiently characteristic, remains, sent to me by Dr. J. Van A. Carter, of Fort Bridger; and by others obtained during Prof. Hayden's exploring expedition the last year.—"Anosteira ornata." One of the turtles is founded upon a number of isolated plates and fragments of others of the carapace of about four different individuals, obtained from Church Buttes and Grizzly Buttes, Wyoming. The specimens are mainly marginal, including two pygal plates. The latter are remarkably thick at the fore part, where they are hollowed into a concavity directed forward, and bounded below by a projecting ledge. This concavity continues outward and forward upon the contiguous marginal plates as a groove, bounded by an inferior ledge, which would appear gradually to become narrower, and disappear at the third marginal plates in advance. The upper part of the pygal plate slopes on each side from a median acute ridge, or carina, which subsides at the posterior third. The marginal and pygal have all been conjoined with the costal plates by suture, and the former in addition by gomphosis, as in living emydes. The free surfaces of the plates are closely covered with radiant elevations. These centrally form rounded tubercles and peripherally more or less interrupted ridges with more or less interrupted branches. Apparently in younger plates the elevations form more continuous radiant and branching ridges, which would appear in older animals to have become more and more broken so as to form rounded tubercles. In some specimens the radiant

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